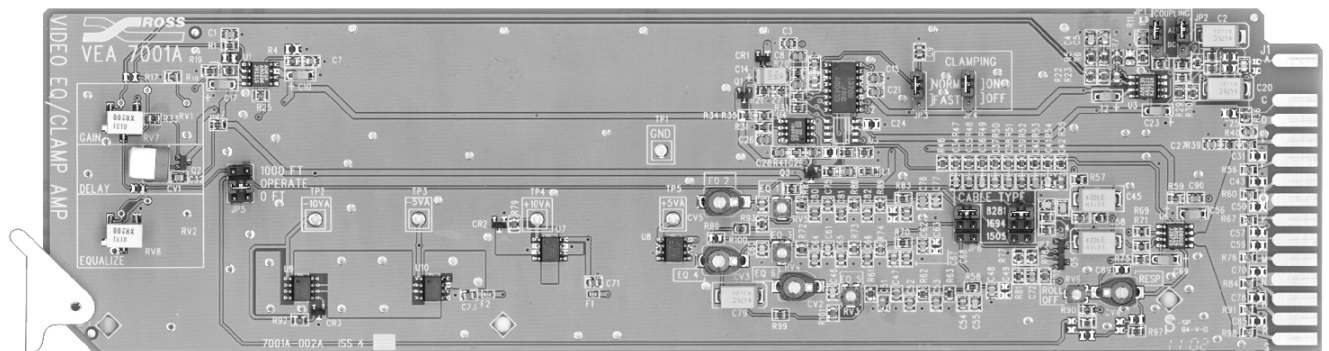


VEA-7001A

Precision Video Equalizing Amplifier with Clamping

User Manual



Ross Part Number: 7001AD-004
Issue: 04

VEA-7001A • Precision Video Equalizing Amplifier with Clamping User Manual

- Ross Part Number: **7001AD-004**
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Important Regulatory and Safety Notices

Before using this product and any associated equipment, refer to the “Important Safety Instructions” listed below so as to avoid personnel injury and to prevent product damage.

Products may require specific equipment, and /or installation procedures be carried out to satisfy certain regulatory compliance requirements. Notices have been included in this publication to call attention to these Specific requirements.

Symbol Meanings



This symbol on the equipment refers you to important operating and maintenance (servicing) instructions within the Product Manual Documentation. Failure to heed this information may present a major risk of damage or injury to persons or equipment.



Warning

The symbol with the word “**Warning**” within the equipment manual indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.



Caution

The symbol with the word “**Caution**” within the equipment manual indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.



Notice

The symbol with the word “**Notice**” within the equipment manual indicates a situation, which if not avoided, may result in major or minor equipment damage or a situation which could place the equipment in a non-compliant operating state.



ESD

Susceptibility

This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from an ESD event.

Important Safety Instructions



Caution

This product is intended to be a component product of the RossGear 8000 series frame. Refer to the RossGear 8000 series frame User Manual for important safety instructions regarding the proper installation and safe operation of the frame as well as it's component products.



Warning

Certain parts of this equipment namely the power supply area still present a safety hazard, with the power switch in the OFF position. To avoid electrical shock, disconnect all A/C power cords from the chassis' rear appliance connectors before servicing this area.



Warning

Service barriers within this product are intended to protect the operator and service personnel from hazardous voltages. For continued safety, replace all barriers after any servicing.

This product contains safety critical parts, which if incorrectly replaced may present a risk of fire or electrical shock. Components contained within the product's power supplies and power supply area, are not intended to be customer serviced and should be returned to the factory for repair.

To reduce the risk of fire, replacement fuses must be the same type and rating.

Only use attachments/accessories specified by the manufacturer.

EMC Notices

US FCC Part 15

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.



Notice

Changes or modifications to this equipment not expressly approved by Ross Video Ltd. could void the user's authority to operate this equipment.

CANADA

This Class "A" digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de classe "A" est conforme à la norme NMB-003 du Canada.

EUROPE

This equipment is in compliance with the essential requirements and other relevant provisions of **CE Directive 93/68/EEC**.

INTERNATIONAL

This equipment has been tested to **CISPR 22:1997** along with amendments **A1:2000** and **A2:2002** and found to comply with the limits for a Class A Digital device.



Notice

This is a Class A product. In domestic environments this product may cause radio interference in which case the user may have to take adequate measures.

Maintenance/User Serviceable Parts

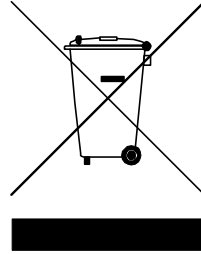
Routine maintenance to this RossGear product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "Contact Us" section on the last page of this manual. All RossGear products are covered by a generous 5-year warranty and will be repaired without charge for materials or labor within this period. See the "Warranty and Repair Policy" section in this manual for details.

Environmental Information

The equipment that you purchased required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Ross Video encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

The crossed-out wheeled bin symbol invites you to use these systems.



If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You can also contact Ross Video for more information on the environmental performances of our products.



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Introduction

In This Chapter

This chapter contains the following information sections:

- A Word of Thanks
- Overview
- Functional Block Diagram
- Features
- Documentation Terms

A Word of Thanks

Congratulations on choosing the Ross Video VEA-7001A Precision Video Equalizing Amplifier with Clamping. The VEA-7001A is part of a full line of Analog Products within the RossGear Terminal Equipment family of analog and digital products, backed by Ross Video's experience in engineering and design expertise since 1974.

You will be pleased at how easily your new VEA-7001A fits into your overall working environment. Equally pleasing is the product quality, reliability and functionality. Thank you for joining the worldwide group of satisfied Ross Video customers!

Should you have a question pertaining to the installation and operation of your VEA-7001A, please contact us at the numbers listed on the back page of this publication. Our technical support staff is always available for consultation, training, or service.

Overview

The unique RossGear VEA-7001A Precision Video Equalizing Amplifier with Clamping precisely and easily equalizes your choice of three popular coaxial cable types: Belden 8281, 1694, or 1505. This 3-cable type selection ability is achieved to a level of accuracy never before obtained in a single amplifier. All other amplifiers on the market are designed primarily for one type of cable and usually achieve mediocre results with other cable types, or require complex and time-consuming adjustment procedures.

During installation, the setting of a single adjustment is all that is needed to obtain unparalleled equalization accuracy, thanks to very accurate factory-calibration. The need to use elaborate frequency response measuring equipment in the field is eliminated. Surface Mount Technology has been used in the manufacture of this card to further eliminate the need for field adjustments.

Back porch clamping is provided to assist in the removal of hum or other signal disturbances. Two clamping speeds are jumper selectable. A differential input gives excellent ground loop rejection. The amplifier input may be AC or DC coupled.

Temperature drift effects are almost non-existent due to the use of the latest in analog ASIC's combined with meticulous product engineering.

The VEA-7001A card is designed for use in the RossGear 7200 series video, and 7850 series A/V distribution frames. The power to each card is individually fused to prevent failure of any one card from affecting the rest of the cards in the frame. RossGear analog (and digital) cards are also designed to fit into distribution frames of some other manufacturers for installation flexibility.

Ross Video Limited is pleased to offer the flexibility of selectable three-cable type precision equalization within a single card slot. The VEA-7001A fills a unique role within the full line of RossGear video distribution products, engineered to satisfy the highest quality broadcast standards and the most demanding requirements of your facility.

Functional Block Diagram

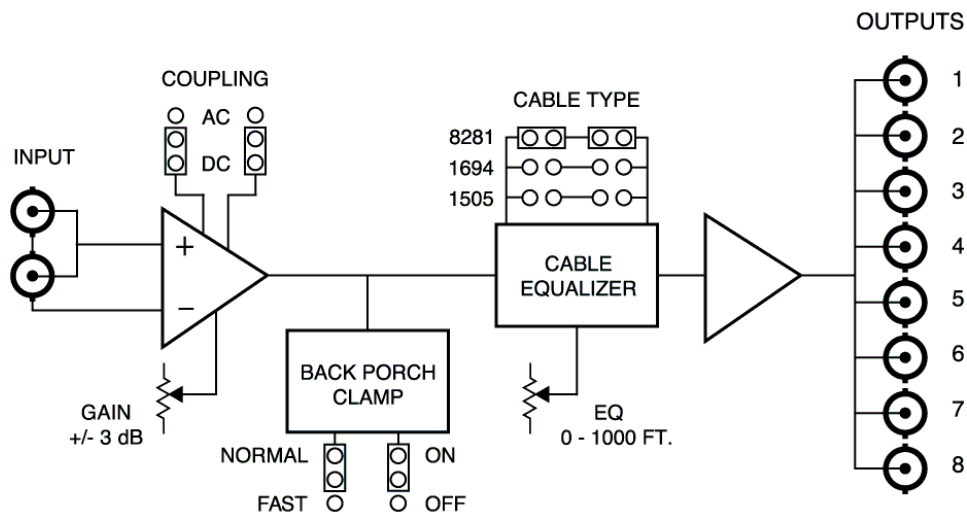


Figure 1. Simplified Block Diagram of VEA-7001A Functions

Features

The following features are unique to the VEA-7001A Precision Video Equalizing Amplifier with Clamping:

- Precision equalization of three selectable coaxial cable types up to 1,000 ft. (305m)
- Easy single-control equalization for fast installation
- AC or DC input coupling
- Eight outputs
- Back porch clamping
- Clamping speed jumper selectable
- Delay matched for precise interchangeability
- Delay adjustable if required for system timing
- Superb stability of frequency response and color timing
- Differential input for outstanding ground loop hum rejection
- Excellent isolation between outputs
- Power to each card is individually fused
- 5-year transferable warranty

Documentation Terms

The following terms are used throughout this guide:

- “**Frame**” refers to the **VFR-7214**, **VFR-7210**, **AVFR-7854C**, and **AVFR-7855C** frames that can house the **VEA-7001A** cards. See the respective User Manuals for details.
- “**Operator**” and “**User**” both refer to the person who uses the **VEA-7001A** cards.
- “**Board**”, “**Card**”, and “**Module**” all refer to the **VEA-7001A** cards, including all components.
- “**System**” refers to the mix of interconnected analog production and terminal equipment in which the **VEA-7001A** cards operate.

Installation and Setup

In This Chapter

This chapter contains the following information sections:

- Static Discharge
- Unpacking
- Jumper Settings
- Board Installation
- Cable Connections
- Module Adjustment

Static Discharge

Whenever handling the VEA-7001A cards and other related equipment, please observe all static discharge precautions as described in the following note:



Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling circuit boards in high static environments such as carpeted areas, and when wearing synthetic fiber clothing. Always exercise proper grounding precautions when working on circuit boards and related equipment.

Unpacking

Unpack each VEA-7001A card you received from the shipping container, and check the contents against the packing list to ensure that all items are included. If any items are missing or damaged, contact your sales representative or Ross Video directly.

Jumper Settings

Use the following figure, card labeling, and discussions to set up VEA-7001A jumpers.

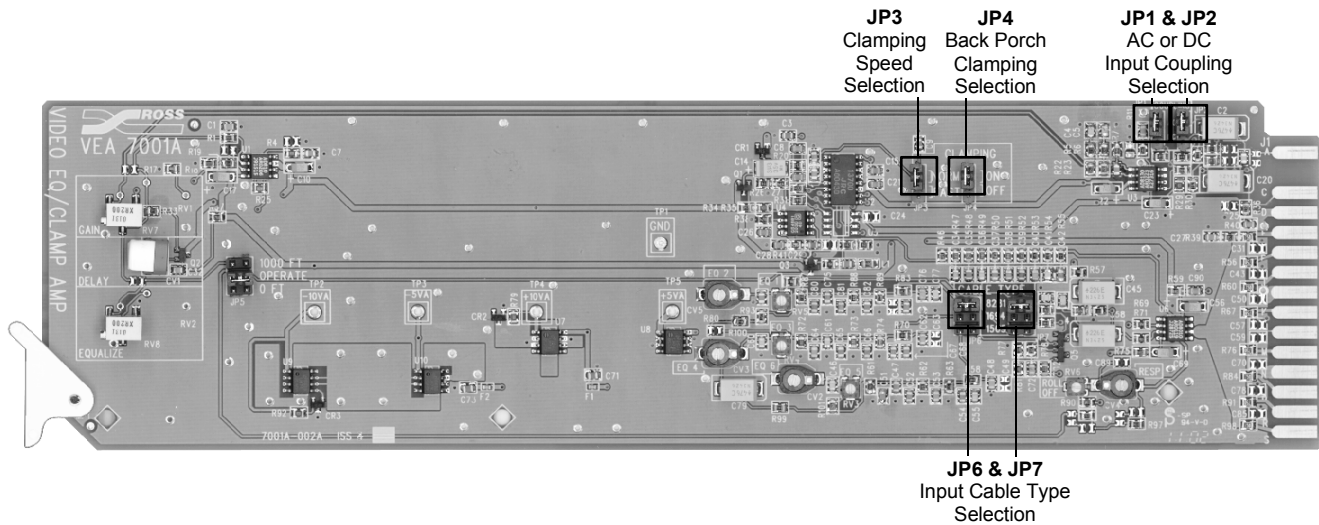


Figure 2. VEA-7001A Jumper Locations

Input Coupling

Set jumpers **JP1** and **JP2** to determine input AC or DC voltage coupling. The two jumpers must *both* be positioned on their AC or DC pin settings. The criteria for setting the coupling jumpers is as follows:

AC: Use this setting if the back porch of the input signal is displaced from ground level by more than ± 0.5 Volts DC.

DC: With this setting, the entire amplifier becomes DC coupled. Default setting.

Back Porch Clamping

Set jumper **JP4** to enable or disable back porch clamping. :

ON: Back porch clamping is active. Default setting.

OFF: Clamping is disabled. Use this setting for any signals not having sync pulses; for example, non-composite or component signals.

Clamping Speed

If jumper **JP4** is set to **ON** position, set jumper **JP3** to configure clamping speed as follows:

NORMAL: This setting is used for normal back porch clamping to set the DC level of the back porch to ground level. Use this setting unless there is a definite reason to use the FAST setting.

FAST: This setting is used for fast back porch clamping. Use this setting for any signals which require clamping in less than 22 lines. This mode may be useful if the input signal is hard switched between two video signals with different DC offsets.

Cable Type Selection

Set jumpers **JP6** and **JP7** to allow the operator to select the input cable type being equalized. The two jumpers must *both* be positioned at only one of the selections: (Belden) **8281**, **1694**, or **1505**. For other cable-types, choose the closest matching cable type from these three selections.

Board Installation

Use the following steps to install the VEA-7001A cards in a RossGear 7200 series video, or 7850 series A/V distribution frame:

1. Refer to the User Manual of the RossGear frame to ensure that the frame is properly installed according to instructions. If this module is to be installed in any compatible frame other than a Ross Video product, refer to the frame manufacturer's manual for specific instructions.
2. Please note that heat and power distribution requirements within a frame may dictate specific slot placement of cards. Cards with many heat-producing components should be arranged to avoid areas of excess heat build-up, particularly in frames using convectional cooling.
3. After selecting the desired frame installation slot, hold the VEA-7001A card by the edges and carefully align the card edges with the slots in the frame. Then fully insert the card into the frame until the rear connection plug is properly seated.

Cable Connections

The following diagram provides instruction for connecting input and output coax cables to the VEA-7001A when mounted in RossGear 7200 series Video, and 7850 series A/V distribution frames.

It is recommended that all unused outputs be terminated. The specifications in this manual are based on all outputs being terminated.

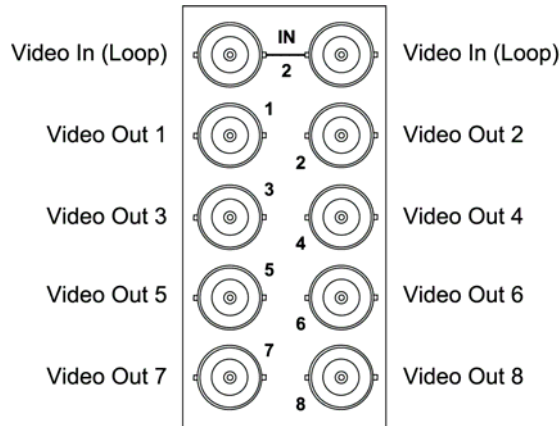


Figure 3. VEA-7001A Cabling Designations for RossGear 7200 and 7850 Series Frames

Module Adjustment

Use the following figure, card labeling, and discussions to set up VEA-7001A performance characteristics.

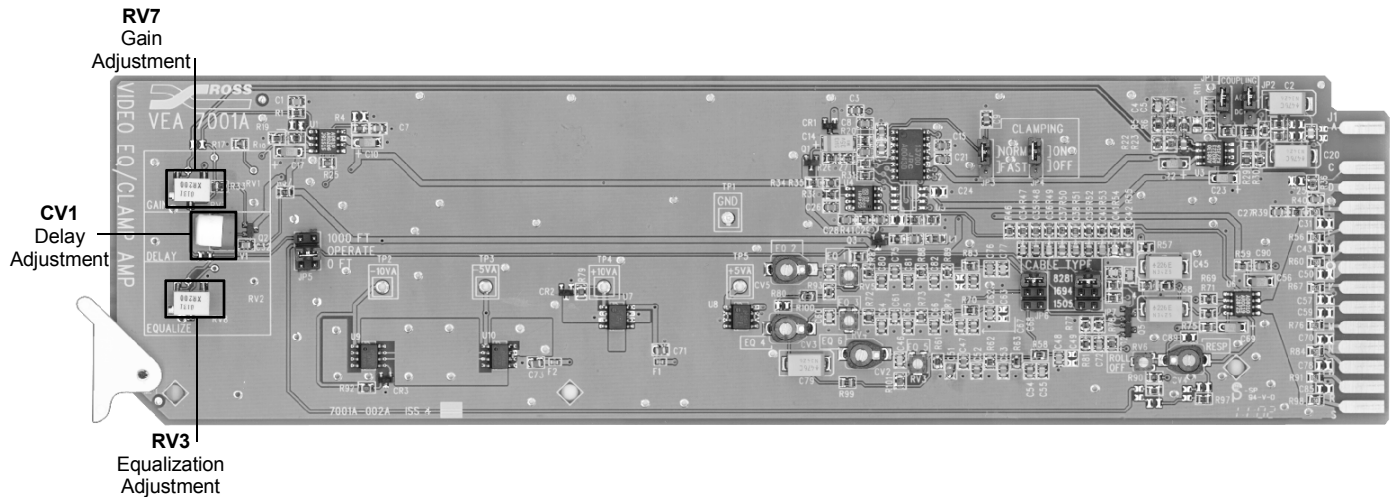


Figure 4. VEA-7001A Module Adjustments

Gain and Equalization

To adjust gain and equalization, set **RV7** (gain) and **RV8** (equalization) as required for your system and cable length. Use any suitable test signal that would enable the signal gain and subcarrier level to be correctly set (e.g. pulse and bar or color bar). A sweep signal can be used, but is not normally necessary.

Delay

The **CV1** delay adjustment is factory-set to ensure that the path length of every VEA-7001A is precisely matched. The 7001A is factory-calibrated to have a delay of 24.0ns. This allows for maximum interchangeability of VEA-7001A cards without affecting system timing. Changing from the factory setting will make this card non-interchangeable due to differences in delay. However, if desired, and interchangeability is not important, the timing adjustment **CV1** may be used to resolve minor system timing problems.

Specifications

In This Chapter

This chapter contains the VEA-7001A Technical Specifications table.

VEA-7001A Technical Specifications

Category	Parameter	Specification
Input	Number of Inputs	1 looped
	Video Input Level	1V p-p
	Input Impedance	75 Ω bridging
	Input Return Loss	43dB to 5MHz
	Max DC on Input	+8 / -1V
	Max Common Mode Signal	15V p-p
	Common Mode Rejection	60dB @ 60Hz
Output	Number of Outputs	8
	Output Impedance	75 Ω
	Output Return Loss	44dB to 5MHz
	Output Isolation	43dB to 5MHz
	DC Offset	<30mV
	Output Loading (per termination at 10MHz)	0.005dB

Category	Parameter	Specification
Performance (all outputs loaded)	Gain Range	±3dB
	Gain Stability	<0.1% per 10°C
	Frequency Response	±0.02dB to 10MHz (cable EQ = 0 ft.)
	Bandwidth	-3dB @ 36MHz
	Line Rate Window Tilt	<0.2%
	Field Rate Window Tilt	<0.2%
	50/60Hz Square Wave Tilt	<0.3%
	Bounce (black to white)	<0.3%
	Differential Gain (10%-90% APL)	<0.1%
	Differential Phase (10%-90% APL)	<0.1°
	RMS Noise 0-5 MHz (unweighted)	73dB
	Chrominance/Luminance Delay	<2.0ns
	Electrical Length	24ns (31° NTSC 38° PAL)
	K Rating 1 T	0.3%
Equalization	Response Accuracy – for all supported cable types	±0.03dB to 8MHz (0 - 1000') (0 - 305m) typically -0.08dB @ 10MHz
Clamping	Recovery Time	6 lines (Clamp on FAST) 22 lines (Clamp on NORM)
	Hum Rejection - Normal Mode	6dB
	Hum Rejection - Fast Mode	30dB
Power	Total Consumption	2.6W

Specifications are subject to change without notification.

Service Information

In This Chapter

This chapter contains the following sections:

- Troubleshooting Checklist
- Warranty and Repair Policy

Troubleshooting Checklist

Routine maintenance to this RossGear product is not required. In the event of problems with your VEA-7001A, the following basic troubleshooting checklist may help identify the source of the problem. If the module still does not appear to be working properly after checking all possible causes, please contact your Ross Video products distributor, or the Ross Video Technical Support department at the numbers listed under the “Contact Us” section at the end of this manual. Ross Video Ltd. is committed to providing a superior customer experience; please contact us with any questions you may have about your VEA-7001A.

1. **Visual Review** – Performing a quick visual check may reveal many problems, such as connectors not properly seated or loose cables. Check the module, the frame, and any associated peripheral equipment for signs of trouble.
2. **Power Check** – Check the power indicator LED on the distribution frame front panel for the presence of power. If the power LED is not illuminated, verify that the power cable is connected to a power source and that power is available at the power main. Confirm that the power supplies are fully seated in their slots. If the power LED is still not illuminated, replace the power supply with one that is verified to work.
3. **Reseat the Card in the Frame.**
4. **Check Control Settings** – Refer to the Installation and Operation sections of the manual and verify all user-components.
5. **Input Signal Status** – Verify that source equipment is operating correctly and that a valid signal is being supplied.
6. **Output Signal Path** – Verify that destination equipment is operating correctly and receiving a valid signal.
7. **Module Exchange** – Exchanging a suspect module with a module that is known to be working correctly is an efficient method for localizing problems to individual modules.

Warranty and Repair Policy

The RossGear VEA-7001A is warranted to be free of any defect with respect to performance, quality, reliability, and workmanship for a period of FIVE (5) years from the date of shipment from our factory. In the event that your RossGear VEA-7001A proves to be defective in any way during this warranty period, Ross Video Limited reserves the right to repair or replace this piece of equipment with a unit of equal or superior performance characteristics.

Should you find that this RossGear VEA-7001A has failed after your warranty period has expired, we will repair your defective product for as long as suitable replacement components are available. You, the owner, will bear any labor and/or component costs incurred in the repair or refurbishment of said equipment beyond the FIVE (5) year warranty period.

In no event shall Ross Video Limited be liable for direct, indirect, special, incidental, or consequential damages (including loss of profits) incurred by the use of this product. Implied warranties are expressly limited to the duration of this warranty.

This RossGear VEA-7001A Precision Video Equalizing Amplifier with Clamping User Manual of our Analog Video Products line provides all pertinent information for the safe installation and operation of your RossGear Product. Ross Video policy dictates that all repairs to the RossGear VEA-7001A are to be conducted only by an authorized Ross Video Limited factory representative. Therefore, any unauthorized attempt to repair this product, by anyone other than an authorized Ross Video Limited factory representative, will automatically void the warranty. Please contact Ross Video Technical Support for more information.

In Case of Problems

Should any problem arise with your RossGear VEA-7001A, please contact the Ross Video Technical Support Department. (Contact information is supplied at the end of this publication.)

A Return Material Authorization number (RMA) will be issued to you, as well as specific shipping instructions, should you wish our factory to repair your RossGear VEA-7001A. A temporary replacement module, if required, will be made available at a nominal charge. Any shipping costs incurred, will be the responsibility of you, the customer. All products shipped to you from Ross Video Limited, will be shipped collect.

The Ross Video Technical Support department will continue to provide advice on any product manufactured by Ross Video Limited, beyond the warranty period without charge, for the life of this equipment.

Ordering Information

In This Chapter

This chapter contains ordering information for the VEA-7001A and related products.

VEA-7001A Video DA and Related Products

Standard Equipment

- **VEA-7001A** Precision Video Equalizing Amplifier with Clamping

Optional Equipment

- **7001AD-004** Precision Video Equalizing Amplifier with Clamping User Manual (additional User Manual)
- **VFR-7214** Video Products Frame and Power Supply (PS-7103) (1 RU, holds 4 modules, includes 1 power supply)
- **VFR-7210** Video Products Frame and Power Supply (PS-7103) (2 RU, holds 10 modules, includes 1 power supply)
- **AVFR-7854C** Analog Products Frame and Power Supply (PS-7103) (1RU, holds 2 audio and 2 video modules, includes 1 power supply)
- **AVFR-7855C** Analog Products Frame and Power Supply (PS-7103) (2RU, holds 5 audio and 5 video modules, includes 1 power supply)
- **PS-7103** Power Supply (85-250 Volts)
- **EXT-7200** Extender Board (module servicing extension)
- **FSB-7110** Frame Support Bracket (module servicing extension)

Your **VEA-7001A Video Equalizing Amplifier** is part of the RossGear family of products. Ross Video Limited offers a full line of RossGear terminal equipment including distribution, conversion, monitoring, synchronizers, encoders, decoders, AES, keyers, control switchers, as well as analog audio and video products.

Notes:

Notes:

Contact Us

Contact our friendly and professional support representatives for the following:

- Name and address of your local dealer
- Product information and pricing
- Technical support
- Upcoming trade show information

PHONE	General Business Office and Technical Support	613 • 652 • 4886
	After Hours Emergency	613 • 349 • 0006
	Fax	613 • 652 • 4425
E-MAIL	General Information	solutions@rossvideo.com
	Technical Support	techsupport@rossvideo.com
POSTAL SERVICE	Ross Video Limited	8 John Street, Iroquois, Ontario, Canada K0E 1K0
	Ross Video Incorporated	P.O. Box 880, Ogdensburg, New York, USA 13669-0880

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